In reviewing the proposal, I note several comments and questions regarding input parameters into the site-specific calculations:

RfD: As stated to you in previous communications, an RfD of 0.14 mg/kg-day should be used for the organism only criterion. The RfD of 0.05 mg/kg-day should be used for the water + org criterion as this includes a modifying factor of three used for the drinking water pathway. Information regarding the modifying factor can be found on the IRIS web page for manganese. The RfD of 0.05 mg/kg-day was also used in the health advisory calculation. PacRim used 0.14 mg/kg-day for both the water + org and org only calculations. Use of the RfD of 0.05 mg/kg-day for the water + org criterion would result in a more stringent criterion.

RSC: The RSC used in calculating the health advisory was 0.2. OST has adopted RSC values from the drinking water program in the past and, given lack of other data to develop an RSC, recommends adopting these values. An RSC of 0.2 should be used for both the water + org and org only calculations. PacRim only applied the RSC to the water + org calculation and used an RSC of zero with the subtraction method (2000 Human Health Methodology) for the org only criterion, thereby calculating a less protective criterion for organism only. For the organism criterion calculation, the 0.2 RSC should be applied using the multiplication method (see 2000 Human Health Methodology). The 2000 Human Health Methodology recommends the use of a 0.2 RSC as a default when data is not available. In this case, guidance is available from the health advisory.

Fish consumption: I note some inconsistencies in the use of fish consumption data in the criteria calculations. PacRim states that the site specific fish consumption in the Chuitna Basin is 187 g/day of salmon and 14 g/day of non-salmon fish for a total of 201 g/day. However, 17.5 g/day was used in the org only criterion calculation. EPA encourages the use of site-specific data in criteria calculations when it is available. For their water + org criterion calculation, PacRim used 187 g/day, not the full 201 g/day fish consumption. 201 g/day fish consumption should be used for both water + org and org only criteria.

BCF/BAF: PacRim states that a site-specific BCF of 5 L/kg is available for salmon, but that it isn't appropriate for use because the fish spend most of their time in the ocean and only arrive in the stream for spawning. Therefore, the fish do not have appropriate exposure times to the water where they are caught for accurate BAF calculations. It appears to me that this value is a BAF, not a BCF. The document states that it is a BCF. I assumed in my evaluation that this is actually a BAF value. PacRim also presents a BCF for brown trout of 17.8 L/kg.

EPA's 2009 site-specific BAF document (http://water.epa.gov/scitech/swguidance/standards/criteria/health/methodology/upload/2008_07_01_criteria_humanhealth_method_tsdvol3.pdf) encourages states and tribes to use site-specific BAFs in criteria calculations as they are more representative than BCFs of ambient exposures to the fish and also to the people consuming the fish. The document also discusses appropriate BAF sampling procedures. While PacRim's conclusion was that the salmon data is inappropriate for use due to limited exposure time to the waters where the fish are caught, the primary species consumed by people living in the basin is salmon. While BAFs from the streams where the fish were collected may not be related to concentrations in the water due to exposure times, the salmon tissue concentrations would represent the most accurate exposures to the consumers. Without reviewing the study, however, I cannot determine if the study was conducted appropriately. Assuming that sampling was appropriate, I recommend use of the salmon BAF with a 201 g/day fish consumption value as it represents the primary species consumed (187g/day of the total 201 g/day). Provided that the remaining 14 g/day of fish consumed does not represent species with known high bioconcentration values, the salmon BAF value can be used for the entire 201 g/day fish consumption value as it represents over 90% of the fish consumed.

I applaud PacRim in their efforts to look at a site-specific modification for the manganese criteria. I would encourage PacRim to take a second look at their criteria calculations for manganese considering the comments above.

Please let me know if you have any questions.